

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

HOWLINK GLOBAL LLC,

Plaintiff,

v.

AT&T, INC, ET AL.,

Defendants.

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Case No. 2:22-cv-00040-JRG-RSP
(Lead Case)

CLAIM CONSTRUCTION ORDER

In these consolidated patent cases, Howlink Global LLC alleges infringement by AT&T, Inc., Verizon Communications, Inc., and their affiliates (together with Intervenor Nokia and Ericsson, “Defendants”) of certain claims from U.S. Patents 8,630,279 and RE46,415. Generally, these patents relate to mobile communication systems. *See* ’279 Patent at 1:9–12 (“The present invention relates to a method for searching a cell in a cellular system that is based on an [OFDM] scheme.”); ’415 Patent at 1:26–31 (“The present invention relates to a low-cost network system that can reduce the network cost by connecting a base station controller (BSC) with a base transceiver station (BTS) [using] matching units that match a dedicated line such as an E1/T1 line to an IP line such as a digital subscriber line (DSL).”).

The parties dispute the scope of seven terms from the ’279 Patent and five terms from the ’415 Patent. Having considered the parties’ briefing and arguments of counsel during the February 24, 2023 hearing, the Court resolves the disputes as follows.

I. BACKGROUND

A. U.S. Patent 8,630,279

The '279 Patent relates to rapid synchronization acquisition in a cellular network, which is acquisition of synchronization between a terminal and base station preferably within 4.5 milliseconds. '279 Patent at 2:5–8; *see also id.* at 1:61–62 (explaining “the terminal should acquire the initial symbol synchronization within 4.5 msec”). In the Background Art section, the patent describes three prior-art techniques for cell searches. *See generally* '279 Patent at 1:26–39, 1:54–56. For various reasons, however, these techniques make rapid synchronization difficult or complex. *See id.* at 1:40–53 (noting rapid synchronization acquisition within the preferred 4.5 milliseconds may be impossible for the first technique), 1:56–67 (explaining initial symbol synchronization may not always be acquired within the preferred 4.5 milliseconds for the third technique).

FIGS. 1–3 show the crux of the invention. As shown in FIGS. 1–2, one frame typically consists of four synchronization blocks of 2.5 milliseconds each. Each synchronization block consists of five subframes, and each subframe is further divided into seven intervals for OFDM symbols. The first interval of the first synchronization block is a synchronization duration. *See generally* '279 Patent at 5:27–5:67. FIG. 3 shows one subframe across multiple subcarriers that implements the inventive concept. Two unique cell identification codes, $C^{(p)}$ and $C^{(q)}$, are in the frequency domain corresponding to a common synchronization channel of the synchronization duration, with symbols spaced apart by one subcarrier. *See id.* at 6:8–17.

Claim 1 recites a method of generating the subframe shown in FIG. 3:

1. A method for generating a downlink signal, comprising:

generating a plurality of unique cell identification code groups;
 and
 allocating the plurality of unique cell identification code groups
 to a plurality of synchronization durations within a downlink
 frame, respectively,
 wherein the plurality of unique cell identification code groups
 comprise a first code group which is formed by a
 concatenation of a first cell identification code and a second
 cell identification code,
 wherein the plurality of unique cell identification code groups
 further comprise a second code group which is formed by a
 concatenation of the second cell identification code and the
 first cell identification code,
 wherein the first code group is different from the second code
 group, and wherein the concatenation of the first cell
 identification code and the second cell identification code
 represents cell identification information.

'279 Patent at 18:10–27.

B. U.S. Patent RE46,415

The '415 Patent describes the technical problem with reference to the typical mobile communication system shown in FIG. 1 (below), which includes Mobile Switching Center (MSC) 10, Base Station Controller (BSC) 20, Base Transceiver Station (BTS) 30 connected to the BSC with an E1/T1 connection, and mobile station 40. When the BTS receives a call process request signal from the mobile station, the BTS transmits a call transmission request signal from the BSC to the mobile station. The BSC controls the BTS for signal transmission between the BTS 30 and the MSC. The MCS transmits the call process request signal to another communication network to provide the mobile communication service to the subscriber. Typically, the BSC and BTS are connected by an E1/T1 dedicated line, which require the BSC and BTS to have E1/T1 access

devices. *See generally* '415 Patent at 4:16–37. But the cost to use an E1/T1 is high for the capacity. *Id.* at 4:61–64.

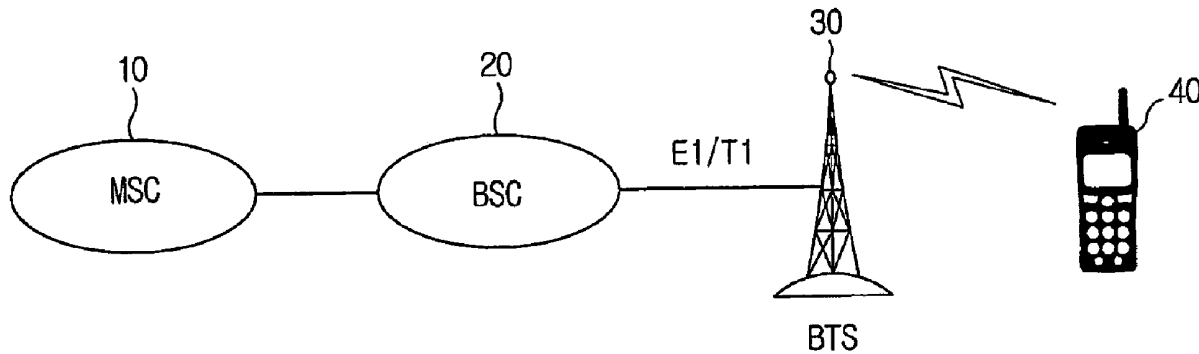


FIG. 1 of the '279 Patent

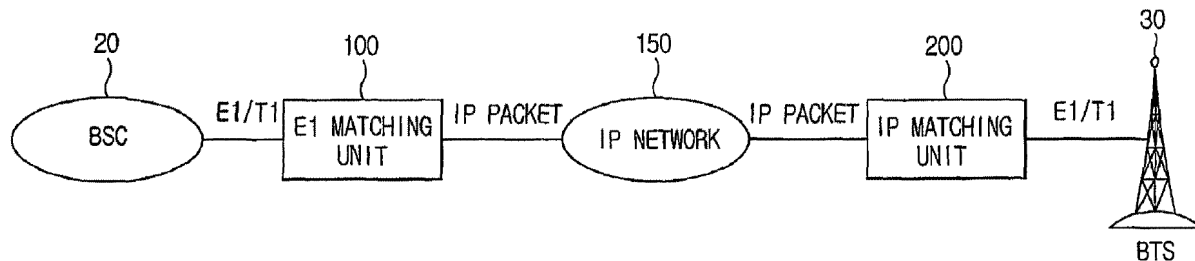


FIG. 2 of the '279 Patent

To address this problem, the patent teaches inserting matching units and an IP network between the BTS and BSC, as shown in FIG. 2 (above). This results in lower leasing and maintenance costs and increases transmission efficiency. *Id.* at 5:59–62 (noting maintenance expenses of the IP network are cheaper than that of an E1/T1 line); *id.* at 6:9–23 (explaining total expenses can be reduced by about 90%).

Claim 1 is directed to the embodiment shown in FIG. 2:

1. A system for signal processing in a mobile communication system, comprising:
 - a base transceiver station (BTS) configured to communicate a call signal with a mobile terminal selected from a plurality of mobile terminals;

- a base station controller (BSC) configured to control wireless communication between the BTS and the mobile terminal;
- a BSC matching unit (BSCMU), being connected to the BSC through a first dedicated line, configured to convert a first dedicated-line data signal transmitted by the BSC into a first set of IP packets and convert a second set of IP packets into a second dedicated-line data signal to be transmitted to the BSC; and
- a BTS matching unit (BTSMU), being connected to the BTS through a second dedicated line, configured to convert the first set of IP packets into the first dedicated-line data signal to be transmitted to the BTS and convert the second dedicated-line data signal transmitted by the BTS into the second set of IP packets to be transmitted to the BSCMU, wherein the BTSMU is further configured to communicate the IP packets with the BSCMU via an IP network.

'415 Patent at 8:19–42.

II. GENERAL LEGAL STANDARDS

A. Generally

“[T]he claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*). As such, if the parties dispute the scope of the claims, the court must determine their meaning. *See, e.g., Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1317 (Fed. Cir. 2007); *see also Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996), *aff’g*, 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*).

Claim construction, however, “is not an obligatory exercise in redundancy.” *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). Rather, “[c]laim construction is a matter of [resolving] disputed meanings and technical scope, to clarify and when necessary to

explain what the patentee covered by the claims” *Id.* A court need not “repeat or restate every claim term in order to comply with the ruling that claim construction is for the court.” *Id.*

When construing claims, “[t]here is a heavy presumption that claim terms are to be given their ordinary and customary meaning.” *Aventis Pharm. Inc. v. Amino Chems. Ltd.*, 715 F.3d 1363, 1373 (Fed. Cir. 2013) (citing *Phillips*, 415 F.3d at 1312–13). Courts must therefore “look to the words of the claims themselves . . . to define the scope of the patented invention.” *Id.* (citations omitted). The “ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, *i.e.*, as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1313. This “person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

Intrinsic evidence is the primary resource for claim construction. *See Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010) (citing *Phillips*, 415 F.3d at 1312). For certain claim terms, “the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” *Phillips*, 415 F.3d at 1314; *see also Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) (“We cannot look at the ordinary meaning of the term . . . in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description and the prosecution history.”). But for claim terms with less-apparent meanings, courts consider “those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean . . . [including] the words of the claims themselves, the remainder of the

specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Id.*

B. Indefiniteness

“[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). The claims “must be precise enough to afford clear notice of what is claimed,” but that consideration must be made while accounting for the inherent limitations of language. *Id.* at 908. “Indefiniteness must be proven by clear and convincing evidence.” *Sonix Tech. Co. v. Publ’ns Int’l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017).

C. Means-Plus-Function Claiming

A patent claim may be expressed using functional language. *See* 35 U.S.C. § 112 ¶ 6 (pre-AIA); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 & n.3 (Fed. Cir. 2015) (en banc in relevant portion). Under 35 U.S.C. § 112 ¶ 6, a structure may be claimed as a “means . . . for performing a specified function,” and an act may be claimed as a “step for performing a specified function.” *Masco Corp. v. United States*, 303 F.3d 1316, 1326 (Fed. Cir. 2002). When it applies, § 112 ¶ 6 limits the scope of the functional term “to only the structure, materials, or acts described in the specification as corresponding to the claimed function and equivalents thereof.” *Williamson*, 792 F.3d at 1347.

But § 112 ¶ 6 does not apply to all functional claim language. There is a rebuttable presumption that § 112 ¶ 6 applies when the claim language includes “means” or “step for” terms, and a rebuttable presumption it does *not* apply in the absence of those terms. *Masco Corp.*, 303 F.3d at 1326; *Williamson*, 792 F.3d at 1348. These presumptions stand or fall according to whether

one of ordinary skill in the art would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts for performing the function. *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (noting § 112 ¶ 6 does not apply when “the claim language, read in light of the specification, recites sufficiently definite structure” (quotation marks omitted) (citing *Williamson*, 792 F.3d at 1349; *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014))); *Williamson*, 792 F.3d at 1349 (noting § 112 ¶ 6 does not apply when “the words of the claim are understood by persons of ordinary skill in the art to have sufficiently definite meaning as the name for structure”); *Masco Corp.*, 303 F.3d at 1326 (noting § 112 ¶ 6 does not apply when the claim includes an “act” corresponding to “how the function is performed”); *Personalized Media Commc’ns, LLC v. I.T.C.*, 161 F.3d 696, 704 (Fed. Cir. 1998) (noting § 112 ¶ 6 does not apply when the claim includes “sufficient structure, material, or acts within the claim itself to perform entirely the recited function . . . even if the claim uses the term ‘means.’” (quotation marks and citation omitted)). *See also Williamson*, 792 F.3d at 1350 (noting “[m]odule’ is a well-known nonce word that can operate as a substitute for ‘means’ in the context of § 112, para. 6”).

III. THE LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the art is the skill level of a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In resolving the appropriate level of ordinary skill, courts consider the types of and solutions to problems encountered in the art, the speed of innovation, the sophistication of the technology, and the education of workers active in the field. *Id.* Importantly, “[a] person of ordinary skill in the art is also a person of ordinary creativity, not an automaton.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007).

Here, the parties proffer their respective levels of ordinary skill through their experts.

Howlink's expert opines:

[A] person of ordinary skill in the art as of the priority date of the '279 patent would have at least a Bachelor's degree in electrical engineering, computer science, or a related field, along with two or more years of work experience in wireless communications networks and devices including synchronization acquisition and signals.

Eslamimehr Decl., Dkt. No. 108-6 ¶ 18. Defendants' expert proffers a similar level of skill in the art:

[A] person of ordinary skill in the art at the time of each alleged invention would have had at least the equivalent of an undergraduate degree in electrical engineering, computer science, or computer engineering, or a related field, and two years of experience in the design, research, development, operations, and/or testing of wireless communications networks or hardware devices, or equivalent combination of education and experience.

Lanning Decl., Dkt. No. 110-8 ¶ 35; *see also id.* at ¶ 119. The Court sees no material differences between these levels of skill in the art, nor do the parties assert such differences in their briefing.

IV. THE DISPUTED TERMS

A. "downlink signal" ('279 Patent, Claim 1)

Howlink's Construction	Defendants' Construction
"signal transmitted from a base station to a mobile station"	No construction necessary; plain and ordinary meaning

The parties dispute whether "downlink signal" should be limited to mobile devices. Howlink contends the term "is well-known in the art and is used by the patent according to its ordinary meaning," but offers no evidence as to what that ordinary meaning is. Dkt. No. 108 at 3. It points only to FIGS. 6–9 and 12–13 of the specification. *Id.* Relying on their expert, Defendants

suggest the plain meaning of the term includes signals transmitted to fixed devices. Dkt. No. 110 at 1.

Considering first the extrinsic evidence, Defendants’ expert declares:

Downlink signal was a common term at the time of patenting, and would have been easily understood by a POSITA without the need for further definition or clarification. Downlink refers to transmissions from a base station to user equipment. User equipment is not limited to a . . . mobile station. A POSITA would have understood a downlink signal to encompass transmission to a fixed station.

Lanning, Decl., Dkt. No. 110-8 ¶ 65.

The intrinsic evidence is not inconsistent with this position. Although Howlink points broadly to FIGS. 6–9 and 12–13, it provides no specifics, such as an alleged definitional statement or disclaimer in the accompanying text. The related text at most describes specific embodiments and does not limit the ordinary meaning of the term Defendants propose. Accordingly, the Court construes “downlink signal” as “signal transmitted from a base station to a mobile or fixed cellular device.”

B. “synchronization durations within a downlink frame” (’279 Patent, Claims 1, 7, 13, 19, 25)

Howlink’s Construction	Defendants’ Construction
“periods of time within a downlink frame during which synchronization signals are transmitted”	No construction necessary; plain and ordinary meaning “a period of time within a downlink frame that may be used for synchronization” (Dkt. No. 110 at 2)

Defendants object to Howlink’s construction as (1) requiring that “synchronization signals are transmitted,” and (2) requiring cell identification code groups be a “synchronization signal.”

Dkt. No. 110 at 2. Howlink disagrees on both counts. Dkt. No. 112 at 5 (citing '279 Patent at 5:32–34, 5:42–46, 6:4–6)

Although there is little daylight between the parties' constructions, Defendants' construction is better. Their expert declares:

“Synchronization durations” and “downlink frame” were a common term at the time of patenting A synchronization duration is a period of time within the downlink frame that may be used for synchronization. A POSITA would not have understood the term “synchronization duration within a downlink frame” to require the transmission of synchronization signals.

Lanning Decl., Dkt. No. 110-8 ¶ 67. Notably, the specification excerpts cited by Howlink are consistent with this description. This is also consistent with how one might understand the term in the abstract: a “duration” is a time period, and “synchronization” with the base station is the purpose of the information in that time period. Howlink's construction, however, could be misunderstood to require transmission.

The Court construes “synchronization durations within a downlink frame” as “periods of time within the downlink frame for synchronization.”

C. “formed by a concatenation of” ('279 Patent, Claims 1, 7, 13, 19, 25)

Howlink's Construction	Defendants' Construction
“formed by an arrangement that combines”	“formed by sequentially linking in a series or chain”

This dispute concerns the scope of “concatenation,” which appears only in the claims. The parties agree the term's scope encompasses Defendants' construction. Howlink, however, contends it defined the term to mean “combination” during prosecution. Dkt. No. 108 at 5–7. At a minimum, says Howlink, the term's ordinary and customary meaning includes “parallel” or “interleaved”

concatenation, so Defendants’ construction is too narrow. Dkt. No. 112 at 1–5. Both parties rely on intrinsic and extrinsic evidence for their positions.

1. The Intrinsic Record

Howlink first relies on the prosecution history. Early in prosecution, the claims required “generating a unique cell identification code group formed *by a combination of* a first cell identification code and a second cell identification code.” Preliminary Amendment (Jul. 11, 2008), Dkt. No. 110-1 at 4.¹ The Office rejected the claims in light of U.S. Patent 5,930,366 (Jamal) as teaching code groups formed by a combination of cell identification. Office Action (Jan. 17, 2012), Dkt. No. 110-2 at 4–6. In response to that rejection, the applicants attempted to replace the claims with new claims using “concatenation” instead of “combination.” Resp. Under 37 C.F.R. § 1.116 (Apr. 17, 2012), Dkt. No. 110-2 at 17 (Claim 28). The applicants argued “Jamal merely discloses the combined code $C_{s/lci}$ where framing synchronization information and long code information (lci) are combined, but does not teach the concatenation of two cell identification codes, *i.e., the combination of two cell identification codes.*” *Id.* at 24 (emphasis added); *see also id.* at 40 (making the same argument but omitting the “i.e.” phrase). The Office, however, refused to enter the accompanying amendments in part because “the term ‘concatenation’ does not have any support within the specifications and cannot be seen or interpreted as mere combination when concatenation specifically means to connect or link in series or chain.” Advisory Action, Dkt. No. 110-2 at 29.

¹ This exhibit includes multiple documents. For ease of reference, the Court refers to the page numbers assigned by the ECF system.

In their next communication, the applicants requested the examiner not enter the previously requested amendments. Resp. Under 37 C.F.R. § 1.114 (May 16, 2012), Dkt. No. 110-2 at 42. The applicants then made identical amendments to the claims but argued:

[A] person having ordinary skill in the art would appreciate that the description of the unique cell identification code group (m,k) in the Specification corresponds to a concatenation of a first cell identification code (m) and a second cell identification code (k), and that the description of the unique cell identification code group (k,m) corresponds to a concatenation of the second cell identification code (k) and the first cell identification code (m). . . . For at least this reason, Applicant believes the original disclosure provides adequate support for the term “concatenation” and, more specifically, for the concept of concatenating two cell identification codes.

In addition, many of the figures in the original disclosure also provide support for the concept of concatenating two cell identification codes. . . . For example, Figure 3 shows the elements of a first unique cell identification code $C^{(p)}$ spaced across a first set of channel band symbols in a synchronization duration, and the elements of a second unique cell identification code $C^{(q)}$ spaced across a second set of channel band symbols in the synchronization duration. As illustrated, the last element of the first unique cell identification code $C^{(p)}$ is positioned adjacent to the first element of the second unique cell identification code $C^{(q)}$. Accordingly, a person having ordinary skill in the art would appreciate that the first unique cell identification code $C^{(p)}$ shown in Figure 3 is concatenated with the second unique cell identification code $C^{(q)}$ For at least this additional reason, Applicant believes the original disclosure provides adequate support for the term “concatenation” and, more specifically, for the concept of concatenating two cell identification codes.

Id. at 41–42. Following that argument, the Office allowed the claims.

Howlink also points to U.S. Published Application 2008/0291945, which issued as U.S. Patent 7,920,598 (Luo) and concerns “synchronization channel sequences generation and scrambling for efficient cell acquisition.” ’598 Patent, Dkt. No. 112-4 at 1:16–18. Luo, which is an obscure part of the intrinsic record as a reference cited by the examiner, ’279 Patent at [56], often refers to “interleaved concatenation.” For example, Luo teaches using a set of scrambling

codes to compose an unscrambled S-SCH sequence through a sequential or interleaved concatenation. ’598 Patent, Dkt. No. 112-4 at 5:61–66; *see also id.* at 8:50–51 (“concatenation can be implemented in a sequential or in an interleaved arrangement”).

2. *The Extrinsic Evidence*

The parties submit extensive extrinsic evidence for their respective positions. Howlink’s expert declares “[b]oth serial concatenation and parallel concatenation would have been known to one of ordinary skill in the art at the time of the invention.” Eslamimehr Decl., Dkt. No. 112-1 ¶ 3. He cites, among other things, Satellite Commc’ns Sys., Dkt. No. 112-2 at 193, which explains “[t]he more conventional way” of applying two codes to a channel is “called serial concatenation to distinguish it from parallel concatenation.” *See also id.* ¶¶ 4–5 (citing references); Dkt. No. 112 at 2.

Defendants also cite extensive extrinsic evidence. Dkt. No. 110 at 3 (citing Lanning Decl., Dkt. No. 110-8 ¶¶ 69–70); Dkt. No. 114 at 2 (citing dictionary definitions). Moreover, Defendants’ expert accuses Dr. Eslamimehr of “conflat[ing] concepts related to concatenation of codes and concepts related to channel coding.” Manning Decl., Dkt. No. 114-1 ¶ 4.

3. *Analysis*

The Court adopts Defendants’ construction. To start, the Court rejects Howlink’s assertion the applicants defined “concatenation” as “combination.” That might have held true had the applicants not withdrawn the January 2017 amendments and remarks. But with that withdrawal, and then by making a new argument and amendments that did not include the same or similar allegedly definitional language, the intrinsic record does not show clear intent by the applicants for the phrase to be definitional. Moreover, this ambiguity is amplified by the clearly different ordinary meanings of “combination” and “concatenation.”

Second, the ordinary and customary meaning of “concatenation” to a skilled artisan does not include “interleaved concatenation.” The record shows Defendants’ construction is the more common definition and thus indicative of what is “customary.” *See* Hr’g Tr., Dkt. No. 137 at 5:24–6:8 (acknowledging sequential concatenation is “the more common definition”); *see also* Satellite Commc’ns Sys., Dkt. No. 112-2 at 193 (explaining “[t]he more conventional way” of applying two codes to a channel is “called serial concatenation to distinguish it from parallel concatenation”). Moreover, Defendants’ construction is amply supported by technical dictionaries, none of which contradict the specification. *See, e.g.,* McGraw-Hill Dict. of Scientific & Tech. Terms (6th ed. 2003), Dkt. No. 110-8 at 118 (defining “concatenate” as “to unite in a sequence, link together, or link to a chain”; defining “concatenation” as “an operation in which a number of conceptually related components are linked together to form a larger, organizationally similar entity”); Newton’s Telecom Dict. (22d ed. 2006), Dkt. No. 110-8 at 122 (defining “concatenation” as “[l]inking together in a series or chain”); Microsoft Comput. Dict. (4th ed. 1999) at 171 (defining “concatenate” as “[t]o join sequentially”). Indeed, the examiner understood “concatenation” similarly. *See* Advisory Action, Dkt. No. 110-2 at 29 (“[C]oncatenation specifically means to connect or link in series or chain.”).

Third, regardless of whether “concatenation” could in some circumstances be understood more broadly than the definition provided by the examiner, the applicants did not challenge the examiner’s statement as to the meaning of the term, which is analogous to the facts in *Biogen Idec, Inc. v. GlaxoSmithKline LLC*, 713 F.3d 1090 (Fed. Cir. 2013). During prosecution of the patent at issue in *Biogen*, which concerned antibodies, the examiner rejected all pending claims based on lack of enablement. According to the examiner, the specification enabled only some of the claimed antibodies. Rather than challenging the examiner’s understanding of the claim, the applicants

argued the specification was enabling for antibodies like those the examiner considered enabled. Similarly, the applicants here could have challenged the examiner's understanding of "concatenation," but chose to argue how the specification supported that understanding. The applicants' choice is especially informative given their request to withdraw the remark that "concatenation" means "combination." *See also TorPharm Inc. v. Ranbaxy Pharms., Inc.*, 336 F.3d 1322, 1330 (Fed. Cir. 2003) ("Whether the patentee chooses to dispute the examiner's view of matters is relevant to claim interpretation, for there a court may need to ascertain exactly what subject matter was actually examined and allowed by the PTO.").

Finally, although Dr. Eslamimehr concludes a skilled artisan would not understand the disputed phrase to require serial concatenation, Eslamimehr Decl., Dkt. No. 112-1 ¶ 6, he bases that conclusion on the fact that "[b]oth serial concatenation and parallel concatenation *would have been known* to one of ordinary skill in the art at the time of the invention," *id.* ¶ 3 (emphasis added). But that a skilled artisan might *know* of two different definitions for a term does not *per se* mean the ordinary and customary meaning of that term includes both definitions.

In sum, the predominance of intrinsic evidence supports Defendants' construction, as does the predominance of extrinsic evidence. The Court therefore construes "formed by a concatenation of" as "formed by sequentially linking in a series or chain."

D. "a cell identifier" ('279 Patent, Claim 13)

Howlink's Construction	Defendants' Construction
Not governed by § 112 ¶ 6; no construction necessary	Governed by § 112 ¶ 6: Function: "obtaining cell identification information" Structure: Indefinite.

1. Whether “cell identifier” is a means-plus-function term

Defendants assert “cell identifier” is not a term that would have connoted specific structure to a skilled artisan at the time of invention. Dkt. No. 110 at 10 (citing Lanning Decl., Dkt. No. 110-8 ¶¶ 82–85. Their expert explains he “was unable to find any use of the term ‘cell identifier’ to refer to a component of a UE, as claimed by ’279 Patent claim 13.” Lanning Decl., Dkt. No. 110-8 ¶ 84.

Howlink contends a skilled artisan would understand “cell identifier” as part of a mobile station and therefore structure. Dkt. No. 108 at 10–11 (citing Eslamimehr Decl., Dkt. No.108-6 ¶¶ 24–27). Because it “is a component in the mobile station that performs an act that is well understood to occur in cellular communications,” it is, says Howlink, a well-known and definite structure found in every mobile station. *Id.* at 11. According to Howlink, Defendants at most show “cell identifier” is not widely used outside the context of the patent, which is not enough to invoke § 112 ¶ 6. Dkt. No. 112 at 6.

The Court agrees with Defendants. Faced with their challenge that the term does not connote sufficiently definite structure, Howlink responds with no structural specifics. Instead, it responds with statements about what the “cell identifier” *does*, a hallmark of functional claiming. *See, e.g.*, Dkt. No. 108 at 11 (stating “the cell identifier is a component in the mobile station that performs an act that is well understood to occur”). Howlink then simply concludes it “is a well-known and definite structure.” *Id.*; *see also* Eslamimehr Decl., Dkt. No.108-6 ¶ 26 (declaring “[t]he claimed phrase . . . identifies a well-known structure within a mobile station—the portion of the user device that obtains the cell identification information that is needed for the device to identify, authenticate, and receive service from cell towers in the cellular network”).

Howlink’s expert points to three excerpts from the specification, *id.* (citing ’279 Patent at fig.12 (item 260), 10:42–46, 13:10–14), but none help Howlink’s cause. The first two excerpts merely show “the mobile station . . . includes a cell identifier.” ’279 Patent at 10:42–45 (describing FIG. 12). The third describes what the “cell identifier” *does*: “[t]he cell identifier 260 *extracts* a unique cell identification code group from the duration symbol.” *Id.* at 13:10–14 (emphasis added). None of these supports the notion the term connotes sufficiently definite structure to avoid invocation of § 112 ¶ 6.

2. *Whether the specification clearly links or associates structure with “cell identifier”*

a. The recited function

Construing a means-plus-function limitation involves two steps. “The first step . . . is a determination of the function of the means-plus-function limitation.” *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001). Based on the express words of the claims at issue, the recited function is “obtaining cell identification information.”

b. The corresponding structure

“[T]he next step is to determine the corresponding structure disclosed in the specification and equivalents thereof.” *Medtronic*, 248 F.3d at 1311. A “structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Id.* The focus of the “corresponding structure” inquiry is not merely whether a structure can perform the recited function, but whether the corresponding structure is “clearly linked or associated” with that function. *Id.* The corresponding structure “must include all structure that actually performs the recited function.” *Default Proof Credit Card Sys. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005).

But § 112 ¶ 6 does not permit “incorporation of structure from the written description beyond that necessary to perform the claimed function.” *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999).

The disclosure of corresponding structure need not be express. *See, e.g.*, M.P.E.P. § 2185 (June 2019) (noting that, “[u]nder certain limited circumstances, the written description does not have to explicitly describe the structure (or material or acts) corresponding to a means- (or step-) plus-function limitation to particularly point out and distinctly claim the invention”). “Disclosure of structure corresponding to a means-plus-function limitation may be implicit in the written description if it would have been clear to those skilled in the art what structure must perform the function recited in the means-plus-function limitation.” *Id.*

Here, a skilled artisan would understand the function of “obtaining cell identification information” is performed by a processor. The patent relates to cellular equipment and identifies the cell identifier 260 as part of a mobile station 200. ’279 Patent at 10:42–446, fig.12. The input to the cell identifier is frequency-domain output from the FFT calculator, and the patent describes the “cell identifier” as performing “processing”-type functions, such as “extracting,” “obtaining,” and “determining.” *See generally* ’279 Patent at 13:10–26.

The patent explains how the processor must be configured with reference to FIG. 12. Specifically,

[t]he cell identifier 260 extracts a unique cell identification code group from the synchronization duration symbol 13 of the frequency domain outputted by the FFT calculator 260, and identifies a cell by correlating it with a plurality of unique cell identification codes used by the cellular system (S460).

’279 Patent at 13:10–14; *see also id.* at 14:59–64 (similar); *id.* at 16:40–45 (similar). Accordingly, the Court finds the corresponding structure for “cell identifier” as “a processor configured to

extract a unique cell identification code group from the synchronization duration symbol 13 of the frequency domain outputted by the FFT calculator 260, and identify a cell by correlating it with a plurality of unique cell identification codes used by the cellular system (S460),” and equivalents thereof.

E. “generator” and “applier” (’279 Patent, Claim 19)

Howlink’s Construction	Defendants’ Construction
not governed by § 112 ¶ 6; no construction necessary	<p>Governed by § 112 ¶ 6</p> <p>Functions:</p> <p>generator: “generating a plurality of unique cell identification code groups”</p> <p>applier: “allocating the plurality of unique cell identification code groups to a plurality of synchronization durations within a downlink frame, respectively”</p> <p>Structures: Indefinite.</p>

1. Whether “generator” and “applier” are means-plus-function terms

Howlink’s arguments with respect to these terms are analogous to those for “cell identifier.” For example, Howlink contends a skilled artisan would understand the claimed “generator” and “applier” are part of the claimed apparatus. Dkt. No. 108 at 12. Howlink then cites to three excerpts from the specification, each of which explains the apparatus includes the generator and applier, and what the generator and applier do. *Id.* (citing ’279 Patent at 6:64–67, 7:4–5, 7:21–25). Finally, Howlink concludes “[t]hese are well known and sufficiently definite structures” to avoid § 112 ¶ 6. *Id.* at 12–13.

For the same reasons articulated in Part IV.D.1 *supra*, this is not enough. Even in its reply, Howlink avoids identifying specific structure or providing additional evidence of what these terms

are. Instead, Howlink only describes what the “generator” and “applier” do. Dkt. No. 112 at 7. Because Howlink does not establish that a skilled artisan would understand these terms as connoting sufficiently definite structure, these terms are governed by § 112 ¶ 6.

2. *Whether the specification clearly links or associates structure with “generator” or “applier”*

The recited functions for these terms are clear from the claim: “generating a plurality of unique cell identification code groups” and “allocating the plurality of unique cell identification code groups to a plurality of synchronization durations within a downlink frame, respectively.” ’279 Patent at 20:3–7. As with “cell identifier,” a skilled artisan would understand these functions as performed by a processor.

FIG. 6 shows the only representation of a generator 110 and applier 130, which are on opposite sides of an IFFT calculator 120. The generator 110 provides frequency-domain input to the IFFT calculator, which outputs a time domain signal to the applier 130. The patent then explains, with respect to FIG. 7:

[T]he downlink frame generator 110 generates a downlink frame as shown in FIG. 1 to FIG. 3 (S110). That is, the downlink frame generator 110 generates a frame including a plurality of synchronization durations, and arranges a unique cell identification code group in the plurality of synchronization durations in the downlink frame. At this time, the downlink frame generator 110 may arrange the unique cell identification code group in the downlink frame such that a plurality of repetition patterns are formed in a time domain.

’279 Patent at 7:4–16; *see also id.* at 7:59–8:6 (similar). Accordingly, the Court finds the corresponding structure for “generator” as “a processor configured to generate a frame including a plurality of synchronization durations, and arrange a unique cell identification code group in the plurality of synchronization durations in the downlink frame. At this time, the downlink frame

generator 110 may arrange the unique cell identification code group in the downlink frame such that a plurality of repetition patterns are formed in a time domain.”

The analysis for “applier” is similar. With respect to FIG. 7, the patent explains:

The frame synchronization applier 130 generates the downlink signal by applying a plurality of frame synchronization identification sequences to the synchronization durations 13 of the signal on the time-axis generated by the IFFT calculator 120 (S130). At this time, the frame synchronization applier 130 applies different frame synchronization identification sequences to the plurality of synchronization durations 13 that are included in the downlink frame.

Id. at 7:21–28; *see also id.* at 8:11–21 (similar). The Court finds this excerpt reflects the corresponding structure for “applier.”

F. “first carrier group” and “second carrier group” (’279 Patent, Claims 3, 4, 15, 16, 21, 22)

Howlink’s Construction	Defendants’ Construction
“first group of radio frequencies” and “second group of radio frequencies,” respectively	Indefinite.

Defendants contend a skilled artisan would not understand “carrier group” because “carrier” refers to the center frequency of the bandwidth used for all OFDM sub-channels. Dkt. No. 110 at 14. They acknowledge a subcarrier is a subset of frequencies within the total frequency range of the carrier, but argue a skilled artisan would not have understood a subcarrier to be equivalent to a carrier. *Id.* Because “there is no discussion of carriers, or grouping of carriers, there is no guidance in the specification for the term ‘carrier group.’” Dkt. No. 110 at 14–15.

The specification provides enough context for these terms. In particular, FIG. 3 shows an OFDM band divided into multiple subcarriers, with “a plurality of unique cell identification codes . . . arranged in a frequency domain of the common synchronization channel[.]” ’279 Patent

at 6:8–11. “This [allows] mobile stations using various bandwidths, such as a mobile station using a 1.25 MHz bandwidth and a mobile station using a 2.5 MHz bandwidth, to receive their unique cell identification codes[.]” *Id.* at 6:42–46. Elsewhere, the patent explains:

When an available band of the synchronization channel is 1.25 MHz, the number of entire available subcarriers is approximately 38. . . . [W]hen twenty subcarriers are allocated in the first unique cell identification code and eighteen subcarriers are allocated in the second unique cell identification code, the total number of identifiable cells becomes 360 (20*18).

Id. at 13:44–50. Thus, the specification expressly refers to allocating identification codes between groups of *subcarriers*, which are carriers derived from a larger frequency range. And based on these excerpts from the specification, the Court construes these terms as “first group of subcarriers” and “second group of subcarriers,” respectively.

G. “call signal” (’415 Patent, Claim 1)

Howlink’s Construction	Defendants’ Construction
“telecommunications signal containing a voice or data communication”	No construction necessary; plain and ordinary meaning. “a signal that facilitates a call” Dkt. No. 110 at 15.

This dispute centers on whether “call signal” includes a “data signal.” Defendants attack Howlink’s construction as improperly broadening the term to include data, such as an email, a text message, a picture, or a tweet. Dkt. No. 110 at 15; *see also* H’rg Tr., Dkt. No. 137 at 49:19–24. They contend a “call” is “a person-to-person voice communication.” H’rg Tr., Dkt. No. 137 at 49:24–25. They further stress the use of both “call signal” and “data signal” in the claims, and point to the prosecution history, where the applicants sought reissue to specifically limit “signal”

to “call signal.” Dkt. No. 110 at 16 (citing Decl. for Reissue Patent Appl’n, Dkt. No. 110-4 at 2).
Notably, this is the only use of “call signal” in the patent.

The Court agrees a “call signal” does not include a “data signal.” According to the patent, the Base Transceiver Station (BTS)

receives a call process request signal from [mobile station] MS 40, and transmits a call transmission request signal from BSC (Base Station Controller) 20 to MS 40. BSC 20 controls BTS 30 for signal transmission between BTS 30 and MSC (Mobile Switching Center) 10. MCS 10 transmits the call process request signal to another communication network to provide the mobile communication service to the subscriber. The other network may be PSTN (Public Switching Telephone Networks) or AMPS (Advanced Mobile Phone Service).

When a subscriber wants to use the mobile communication service via MS 10, the MSC 10 finds the location of the receiver’s MS according to the control signal from BSC 20 and provides mobile communication services such as transmission of a voice/fax signal or access to another communication network according to the request from MS 40.

’415 Patent at 4:20–37. Thus, a “call” is more than simply transmitting data. It requires the transmission and receipt of call setup messages, which further suggests a process of reserving a communication channel for an extended time. Similarly, the patent’s reference to voice and fax signals suggests lengthy call durations relative to the time needed to transmit emails, text messages, and tweets.

Defendants also submit evidence associating a “call” with voice traffic. *See* Wireless Communications: Principles and Practices (2d ed. 1996), Dkt. No. 110-9 at 118 (noting “a subscriber’s telephone call (voice traffic) requires dedicated network access to provide real-time communications” and distinguishing between “*connection-oriented services* (virtual circuit routing), and *connectionless services* (datagram services)”). This aligns with the patentee’s decision to limit “signal” to “call signal” in the reissue, which must be given some weight as the

only substantive change in the original claims and the basis for the application. Accordingly, the Court construes “call signal” as “telecommunications signal containing a voice communication.”

H. “BSC matching unit” (’415 Patent at 1, 17, 19); “BTS matching unit” (’415 Patent at 1, 16, 18)

Howlink’s Construction	Defendants’ Construction
Not governed by § 112 ¶ 6	Governed by § 112 ¶ 6.

The sole dispute about these terms is whether they are governed by § 112 ¶ 6.² Defendants contend these terms are not terms of art and a skilled artisan would not have understood them to connote any specific structure or class of structures. Dkt. No. 110 at 17–18 (citing Lanning Decl., Dkt. No. 110-8 at 17–18). Howlink counters that, while these terms might not commonly appear in technical references outside the patent, “the meaning of these terms is clear and clearly connotes structure.” Dkt. No. 108 at 18.

Howlink, however, misstates the test. *Williamson* does not require that the term only connote structure. Rather, to avoid invoking § 112 ¶ 6, the term must be understood by a skilled artisan as having “sufficiently definite meaning *as the name for structure*.” See *Williamson*, 792 F.3d at 1349 (emphasis added). In other words, a skilled artisan must be able to understand the metes and bounds of the structure from the intrinsic record or the claim is impermissibly covering all structure that performs the recited function.

² Howlink’s reply criticizes Defendants’ identification of corresponding structure. Dkt. No. 112 at 8–9. In their sur-reply, Defendants indicate they “are amenable to adding the structures identified by Howlink. Thus, the sole remaining dispute is whether the terms are subject to means-plus-function.” Dkt. No. 115 at 9.

These are means-plus-function terms. Howlink does not show how a skilled artisan would understand these terms as *the name* for structure. Rather, Howlink states that, “while the terms [might] not, in that particular syntax, commonly appear in technical or other references outside the patent, the meaning of the terms is clear.” Dkt. No. 108 at 18. But Howlink never explains that meaning. Instead, like the other means-plus-function terms discussed *supra*, Howlink points to references in the specification that explain what each of these matching units do. Dkt. No. 108 at 16–17. Howlink also points to references in the specification as to what these units comprise, *see* Dkt. No. 108 at 17, but that addresses *Williamson’s second* inquiry rather than the *first*.

Having concluded these are means-plus-function terms, the Court adopts the structure identified by Howlink in its reply. *See* Dkt. No. 112 at 8–9.

I. “IP address controller” (’415 Patent, Claims 8, 14)

Howlink’s Construction	Defendants’ Construction
“memory that stores or maintains an IP address of the IP line”	Plain and ordinary meaning.

Defendants attack Howlink’s construction as reading language into the claims. Howlink replies that the claims themselves state the IP address controller maintains the IP address. Dkt. No. 112 at 9. Although it acknowledges “‘controller’ typically connotes a component that ‘control’s’ something,” Dkt. No. 108 at 19, Howlink points to the claims and specification for either implicit lexicography or disavowal. Specifically, it cites Claim 1 and Claim 14, each of which requires “an IP address controller configured to maintain an IP address of the IP network.” ’415 Patent at 9:7–10; *see also id.* at 9:43–46. The specification contains a similar reference. *See* ’415 Patent at 2:27–29 (“the BSCMU further comprises an IP address controller for maintaining an IP address of the IP line connecting the BSCMU with the BTSMU”).

The Court agrees with Defendants. These excerpts do not clearly redefine the term or disclaim scope. To the contrary, they simply explain what the controller must do. Moreover, Howlink does not contend a “controller” cannot include memory for the “maintaining” function. The Court therefore rejects Howlink’s construction but will otherwise give this term its plain and ordinary meaning.

J. “buffer state monitor” (’415 Patent, Claims 21, 23)

Howlink’s Construction	Defendants’ Construction
Not governed by § 112 ¶ 6; no construction necessary	<p>Governed by § 112 ¶ 6.</p> <p>Function: produce buffer state data relative to a current state and a maximum storing capacity of the buffer to be transmitted to the [BSCMU/BTSMU]</p> <p>Structure: Indefinite</p>

1. Whether “buffer state monitor” is a means-plus-function term

Howlink urges this term is structure based on the specification. But as with the other means-plus-function terms, Howlink presents no evidence a skilled artisan would understand “buffer state monitor” as having sufficiently definite meaning *as the name* for structure. Accordingly, the Court concludes this is a means-plus-function term.

2. Whether the specification clearly links or associates structure with “buffer state monitor”

The claimed buffer state monitor’s function is “produc[ing] buffer state data relative to a current state and a maximum storing capacity of the buffer to be transmitted to the [BSCMU/BTSMU].” ’415 Patent at 10:55–58; *see also id.* at 10:64–67. According to Defendants, “the specification attributes that function solely to the black box ‘matching unit’ and does not

identify any structure or algorithm for performing that function.” Dkt. No. 110 at 21. Howlink does not contest this assertion or provide alternative allegedly corresponding structure.

The patent describes a buffer with respect to FIG. 4 as part of converting IP packets into E1/T1 signals. Specifically, the matching unit 200 receives IP packets from the IP network through an interface 210. A controller stores the received IP packets at a buffer 230, which allows later reconstruction of the larger message. Also, the IP matching unit 200 sends buffer state data indicating the size and state of the buffer to the E1/T1 matching unit to allow for controlling the transmission speed of IP packets. *See generally* ’415 Patent at 6:30–53; *id.* at 7:38–59 (describing the buffering process with reference to FIG. 6).

A skilled artisan would understand the corresponding structure as controller 220. As shown in FIG. 4, the buffer 230 is connected only to controller 220 and IP packet converter 240. The latter converts IP packets at the buffer into E1/T1 signals. Only the controller is situated to perform the recited function. Accordingly, the Court finds “controller 220” as the corresponding structure for this term.

V. CONCLUSION

Disputed Term	The Court’s Construction
“downlink signal” (’279 Patent, Claim 1)	“signal transmitted from a base station to a mobile or fixed cellular device”
“synchronization durations within a downlink frame” (’279 Patent, Claims 1, 7, 13, 19, 25)	“periods of time within a downlink frame for synchronization”

<p>“formed by a concatenation of” (’279 Patent, Claims 1, 7, 13, 19, 25)</p>	<p>“formed by sequentially linking in a series or chain”</p>
<p>“a cell identifier” (’279 Patent, Claim 13)</p>	<p>Function: obtaining cell information</p> <p>Structure: a processor configured to extract a unique cell identification code group from the synchronization duration symbol 13 of the frequency domain outputted by the FFT calculator 260, and identify a cell by correlating it with a plurality of unique cell identification codes use by the cellular system (S460); and equivalents thereof.</p>
<p>“generator” (’279 Patent, Claim 19)</p>	<p>Function: generating a plurality of unique cell identification code groups</p> <p>Structure: a processor configured to generate a frame including a plurality of synchronization durations, and arrange a unique cell identification code group in the plurality of synchronization durations in the downlink frame; and equivalents thereof.</p>
<p>“applier” (’279 Patent, Claim 19)</p>	<p>Function: allocating a plurality of unique cell identification code groups to a plurality of synchronization durations within a downlink frame, respectively</p> <p>Structure: a processor configured to generate the downlink signal by applying a plurality of frame synchronization identification sequences to the synchronization durations 13 of the signal on the time-axis generated by the IFFT calculator 120 (S130). At this time, the frame synchronization applier 130 applies different frame synchronization durations 13 that are included in the downlink frame; and equivalents thereof.</p>
<p>“first carrier group” and “second carrier group” (’279 Patent, Claims 3, 4, 15, 16, 21, 22)</p>	<p>“first group of subcarriers” and “second group of subcarriers”</p>
<p>“call signal” (’415 Patent, Claim 1)</p>	<p>“telecommunications signal containing a voice communication”</p>

<p>“BSC matching unit” (’415 Patent at 1, 17, 19)</p>	<p>Functions:</p> <p>Cl. 1: (i) convert a first dedicated-line data signal transmitted by the BSC into a first set of IP packets; (ii) convert a second set of IP packets into a second dedicated-line data signal to be transmitted to the BSC</p> <p>Cl. 17: (i) input one of an Internet protocol (IP) signal and a dedicated-line data signal and output the other signal; (ii) communicate the dedicated-line data signal with the BSC via the first dedicated line; and (iii) communicate the IP signal with a base transceiver station matching unit (BTSMU) via an IP network</p> <p>Cl. 19: (i) receiving one of an Internet protocol (IP) signal and a dedicated-line data signal and outputting the other signal, (ii) communicate the dedicated-line data signal with the BSC via the first dedicated line, and (iii) communicate the IP signal with a base transceiver station matching unit (BTSMU) via an IP network</p> <p>Structure:</p> <p>Cl. 1: elements of E1 matching unit 100, specifically the E1/T1 converter 130, as shown in Fig. 5 and as described at 6:63–7:1 of the ’415 Patent, IP Packet Converter 240; and equivalents thereof</p> <p>Cl. 17: IP interface 210, E1/T1 transmitter 250, IP Packet converter 240, elements of E1 matching unit 100, specifically the E1/T1 receiver 110, the controller 120, the E1/T1 converter 130, and the IP interface 140, as shown in Fig. 5 and as described at 6:63–7:2 of the ’415 Patent; and equivalents thereof</p> <p>Cl. 19: IP Interface 210, E1/T1 transmitter 250, IP Packet converter 240, elements of E1 matching unit 100, specifically the E1/T1 receiver 110, the controller 120, the E1/T1 converter 130, and the IP interface 140, as shown in Fig. 5 and as described at 6:63–7:2 of the ’415 Patent; and equivalents thereof</p>
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<p>“BTS matching unit” (’415 Patent at 1, 16, 18)</p>	<p>Functions:</p> <p>Cl. 1: (i) convert the first set of IP packets into the first dedicated-line data signal to be transmitted to the BTS; (ii) convert the second dedicated-line data signal transmitted by the BTS into the second set of IP packets to be transmitted to the BSCMU, and (iii) communicate the IP packets with the BSCMU via an IP network</p> <p>Cl. 16: (i) input one of an Internet protocol (IP) signal and a dedicated-line data signal and output the other signal; and (ii) communicate the dedicated-line data signal with the BTS via the first dedicated line; and (iii) communicate the IP signal with a base station controller matching unit (BSCMU) via an IP network</p> <p>Cl. 18: (i) receive one of an Internet protocol (IP) signal and a dedicated-line data signal and outputting the other signal, (ii) communicate the dedicated-line data signal with the BTS via the first dedicated line, and (iii) communicate the IP signal with a base station controller matching unit (BSCMU) via an IP network</p> <p>Structure:</p> <p>Cl. 1: E1/T1 converter 130, elements of IP matching unit 200, specifically the IP packet converter 240, as shown in Fig. 4 and as described at 6:32–51 of the ’415 Patent; and equivalents thereof</p> <p>Cl. 16: E1/T1 converter 130, elements of IP matching unit 200, specifically the IP interface 210, the controller 220, the IP packet converter 240, and the E1/T1 transmitter 250, as shown in Fig. 4 and as described at 6:32–53 of the ’415 Patent; and equivalents thereof</p> <p>Cl. 18: E1/T1 receiver 110, IP interface 140, E1/T1 converter 120, elements of IP matching unit 200, specifically the IP interface 210, the controller 220, the IP packet converter 240, and the E1/T1 transmitter 250, as shown in Fig. 4 and as described at 6:32–53 of the ’415 Patent; and equivalents thereof</p>
<p>“IP address controller” (’415 Patent, Claims 8, 14)</p>	<p>Plain and ordinary meaning.</p>

“buffer state monitor” ('415 Patent, Claims 21, 23)	<p>Function: produce buffer state data relative to a current state and a maximum storing capacity of the buffer to be transmitted to the BSCMU/BTSMU</p> <p>Structure: controller 220; and equivalents thereof.</p>
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The Court **ORDERS** each party not to refer, directly or indirectly, to its own or any other party's claim-construction positions in the presence of the jury. Likewise, the Court **ORDERS** the parties to refrain from mentioning any part of this opinion, other than the actual positions adopted by the Court, in the presence of the jury. Neither party may take a position before the jury that contradicts the Court's reasoning in this opinion. Any reference to claim construction proceedings is limited to informing the jury of the positions adopted by the Court.

SIGNED this 16th day of March, 2023.


 ROY S. PAYNE
 UNITED STATES MAGISTRATE JUDGE